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# AVIATION & WIRELESS News

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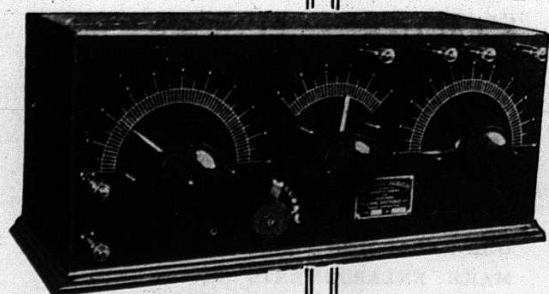
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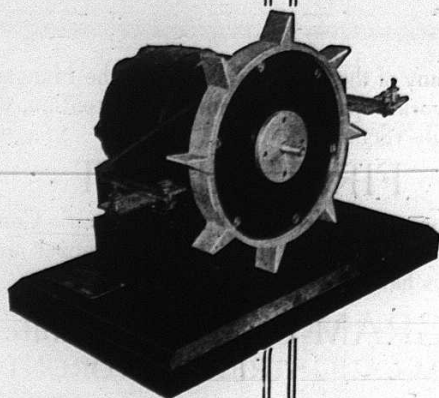


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## OBJECTS OF THE AERO CLUB

1. TO PROMOTE AND MAINTAIN A SOCIAL ORGANIZATION OR CLUB FOR THE ADVANCEMENT AND ENCOURAGEMENT OF VARIOUS FORMS OF AVIATION.
2. TO ADVANCE THE DEVELOPMENT OF THE SCIENCE OF AERONAUTICS AND ITS PRACTICAL APPLICATION.
3. TO ENCOURAGE AND ASSIST THOSE DESIROUS OF TAKING UP AVIATION WITH A VIEW OF RENDERING SERVICE TO KING AND COUNTRY.

### OBJECT NO. 1

Club quarters are being maintained, including lounge, billiards, cardroom and lunchroom.

\* Until further notice the Clubrooms are open daily from 9 A.M. to 6 P.M. except Sundays and public holidays.

\* Meals are served daily to members and their guests.

\* THE DIRECTORS ARE NOW CONSIDERING PROPOSITIONS FOR MORE ADEQUATE QUARTERS IN WHICH IT IS HOPED TO PROVIDE BEDROOM ACCOMMODATION FOR VISITING MEMBERS.

\* As soon as deemed advisable and practicable, the Club will endeavour to maintain and operate an airharbor and suitable aircraft for the use of members, or to make suitable arrangements with an existing concern.

\* Out-of-town members are invited to write in to the club on any matters in which the Club can reasonably render personal service for members.

### OBJECT NO. 2

Ways and means are being provided for making the Club a clearing house and information bureau on matters of aeronautical interest.

\* Members and others are invited to correspond with the Club—especially those who are engaged in commercial aviation, or are in a position to teach flying.

\* Owners of aircraft open for contract work are invited to register with the Club. Full information with regard to equipment and terms should be given.

\* It is desired to obtain costs of operation in order that reliable data may be compiled for the use of members and aviation interests.

### OBJECT NO. 3

The Club is in favour of the Government maintaining an Air Force on adequate and economical lines consistent with the considered opinions, as to organization, of those competent to advise.

\* The Club will use its influence and organization in encouraging the youth of our country to engage in aeronautical work for the development of our commerce and natural resources, and for service to the Empire when necessary.

## MEMBERSHIP

Membership is open to Officers of the Canadian Air Force, Officers and Cadets of the Royal Air Force, and other branches of the Canadian and Imperial United Services; also to civilians wishing to take up or become interested in aviation generally. Apply to the Secretary for terms of membership and application forms.

Membership carries privileges of visiting membership in all Aero Clubs throughout the world affiliated with the Federation Aeronautique Internationale.

The regular monthly issue of *Aviation News* is mailed free to all members.

## AERONAUTICAL SPORTING EVENTS, RECORDS, ETC.

The Federation Aeronautique Internationale is recognized throughout the world as the dominant authority for the control of aeronautical sporting events and for the establishment of aeronautical records, and provides the necessary rules and regulations for the conduct of such. By agreement through the Royal Aero Club of the United Kingdom, authority has been vested in the Aero Club of Canada to represent and act for the F. A. I. in the Dominion of Canada.

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*Distributors of Reliable Radio Apparatus  
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**SERVICE FILLS ORDERS ON  
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**WHY NOT LET US SERVE YOU?**



"PITTSO"

**SERVICE REACHES ALL OVER  
THE WORLD**

**WHY NOT LET IT REACH YOU?**

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No. 231-A General Radio, new type ..... **5.00**

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No. A-3 Acme, fully mounted ..... **7.00**  
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No. P-1 Paragon, moulded type, very small and compact ..... **6.00**

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No. 7650 Standard, 22.5 V. variable ..... **3.50**  
No. 766 Eveready, 22.5 V. large ..... **3.50**  
No. 766-A Eveready, large, variable ..... **3.00**  
No. 763 Eveready, 22.5 V. small ..... **2.25**  
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## AMPLIFIERS

No. RORK Grebe two step with automatic filament control ..... **55.00**  
No. RORD Grebe Det. and two step with automatic filament control ..... **75.00**  
No. P-1 Amrad Type A, two step ..... **39.50**  
No. DA Westinghouse, Det. and two step just out! ..... **65.00**

## CONDENSERS (Fixed mica type)

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No. ROCD Grebe .0005 MF ..... **1.20**  
No. ROCE Grebe .001 MF ..... **1.60**  
No. ROCF Grebe .005 MF ..... **3.00**  
No. ROCA Grebe .0002 MF and .5 meg. leak ..... **1.20**  
No. ROCB Grebe .0002 MF and .3 meg. leak ..... **1.20**

## GRID LEAKS

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Grid leaks only ..... **.75**  
Bases only ..... **.50**  
No. 21 Chelsea, variable, .5 to 5 megohms. ..... **3.00**

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Type R-3 Magnavox loud speaker, latest model, just out! ..... **45.00**  
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Magnavox Radiophone transmitter tone-arm ..... **37.50**

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No. CR-6 Grebe 175-680 meters, receiver, det. and two step amplifier self-contained, complete set ..... **200.00**  
No. CR-7 Grebe 500-20000 meters, "Long-wave special," with tube control, complete set. Ideal for arcs ..... **210.00**  
No. RA Westinghouse, 180-700 meters, new type, just out! ..... **65.00**

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No. 50 Pacent universal type ..... **2.00**  
No. 1423-W Federal, brass ..... **2.00**  
No. 1428-W Federal, silver-plated ..... **2.50**

## JACKS

No. 1421-W Federal, open circuit ..... **.70**  
No. 1422-W "closed circuit" ..... **.85**  
No. 1423-W "two circuit" ..... **1.00**  
No. 1435-W "automatic filament control type" ..... **1.20**  
No. 1438-W Federal Auto. filament type ..... **1.50**

## MICROPHONES

No. 260-W Federal hand type ..... **7.00**  
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No. 5178-A Conn., with short adjustable arm, ideal for panels ..... **4.25**

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No. P-1 Paragon, very compact ..... **1.75**

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No. 550 Murdock ..... **1.00**  
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No. S-3 Radio Service triple ..... **3.50**  
No. UV 203-A Radio Corporation type for the UV-203 50-watt tube ..... **5.00**

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Browns 8000 ohms English type ..... **22.00**

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No. UV-201 Radiotron amplifier ..... **6.50**  
No. UV-202 Radiotron 5 Watt transmitter ..... **8.00**  
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No. UV-204 Radiotron 250 Watt transmitter ..... **110.00**

Note—All radiotrons sent postage and insurance prepaid to any part of U. S. A. and Canada. Radiotrons always in stock.

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No. BX-7 Harvard 6 volts - 80 amp-hours ..... **21.50**

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No. 345-G Murdock grid type ..... **7.50**  
No. 345-P Murdock plate type ..... **7.50**  
No. 346 Murdock Vario-coupler ..... **6.50**  
No. ZRV Clapp-Eastham Variometer with dial ..... **6.50**  
No. ZRV-A Clapp-Eastham Variometer only ..... **5.75**  
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## POTENTIOMETERS

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No. 93 Remler "A" Battery type ..... **.75**  
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For panel mounting ..... **2.50**  
No. PR-536 Radio Corp. type "A" Battery ..... **2.00**

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No. 1 Ward Leonard 500 ohms ..... **2.25**  
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# AVIATION & WIRELESS NEWS

JOURNAL OF THE AERO CLUB OF CANADA  
AND  
COMMERCIAL AIR PILOTS ASSOCIATION

ADAM F. PENTON, Publisher.

C. LINCOLN-MITCHELL, Publication Manager

Volume 4.

TORONTO, JULY, 1921.

No. 5

## NEW HOME of THE AERO CLUB of CANADA

The directors of the Aero Club of Canada have been faced with some of the serious problems which frequently concern such organizations and in particular with the conditions attendant on world-wide social and industrial readjustment and a year of general depression.

The club, originally organized in the interests of those engaged in aviation service during the war and now extended to embrace all branches of the Canadian and Imperial Forces as well as civilians desiring to become interested in Aeronautics, is maintained and supported by young men.

The policy is that it shall continue to be a man's club, and that in service and standing it shall be second to none in the Dominion of Canada.

Before going further into the question of the future policy of the club, the recent decisions and action of the board of directors should be given.

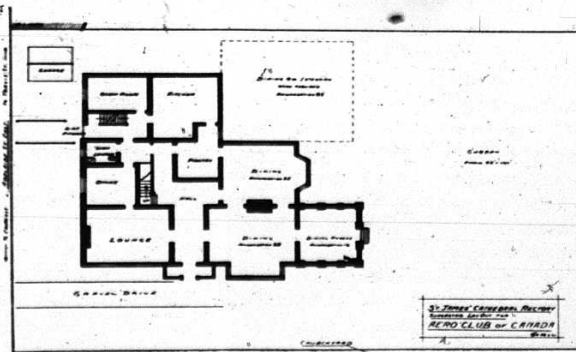
After some months of careful consideration, it was decided that now, even in a year of depression with general financial conditions in a more or less precarious state, plans should be made to enter into arrangements to establish the club on a sound basis.

The principal problem to be faced was the securing of adequate and suitable accommodation of a more or less permanent nature, and as near as possible to the centre of the business section. After examining many prospective buildings, the board has secured the St. James' Cathedral rectory on a favorable lease with a first option to purchase. The accompanying view and plans will fairly indicate the fortunate position we are in of possessing club quarters without equal in the business section of the City of Toronto. The club house is situated on Adelaide St. East, just three minutes' walk from Yonge St. It is

in a quiet neighborhood and stands in its own grounds. All the best and most comfortable of good club features can be arranged for in the new building. A feature which no other club so close to the centre of the city possesses is the open grounds, which will admit of certain recreative pleasure. Special sections for recreation in racquets, tennis, bowling, flying, etc., will be established as soon as facilities can be obtained.

The residential accommodation will prove a great convenience to non-resident members visiting Toronto.

Another feature which perhaps no other similar club in Canada offers to its members is its affiliation with the Federation Aeronautique Internationale, through which members of the Aero Club of Canada have the privilege of being guest members in at least sixteen of the prin-



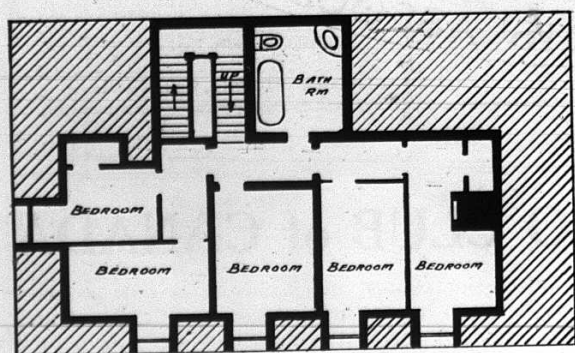
**GROUND FLOOR PLAN,**  
Showing extent of grounds in relation to the building.  
The size of lot is 101 ft. x 180 ft.

cial countries throughout the world in which there are aero clubs established. This applies particularly in Great Britain, France, Belgium, Italy, Spain, Switzerland, Japan, United States, Brazil, South Africa, Australia, etc.

This Dominion-wide and world-wide feature has already proved invaluable. In the present quarters no day scarcely goes by without members of this club and visiting members from other clubs unexpectedly meeting old comrades or acquaintances.

Connections with other organizations and interests are being established in various directions for the benefit of members generally. A part of the club's activity is devoted to assisting in the development of aeronautics and in encouraging the use of aircraft as a means of national defence, conservation and development of national resources.

The club has very recently been honored by H.R.H. the Prince of Wales accepting the honorary presidency. It is also hoped that permission may soon be obtained to change the name to the Royal Aero Club of Canada.



ATTIC.

### LETTER OF APPRECIATION

The following letter of appreciation has been received by the Aero Club of Canada from President Reddin of Aeromarine Engineering & Sales Co. of New York:

Mr. A. J. Hember, Secretary The Aero Club of Canada,  
34 Yonge St., Toronto, Canada.

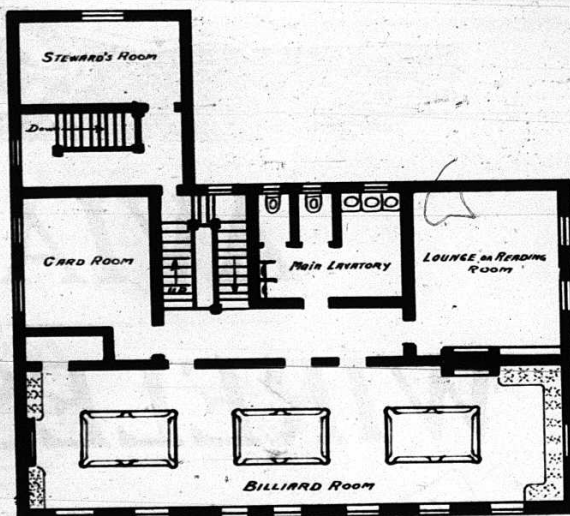
Dear Mr. Hember,—I have just returned to my office after a month's absence in Detroit, Cleveland and Washington, and am delighted to find your very kind letter of May 16th awaiting me.

It is difficult to tell you just how much we all appreciated the splendid hospitality and courtesy we received at your hands and how we enjoyed meeting the different members of your club. However, I can assure you that such experiences as these afford very pleasant recollections and form the high lights which we delight to cherish in our memory.

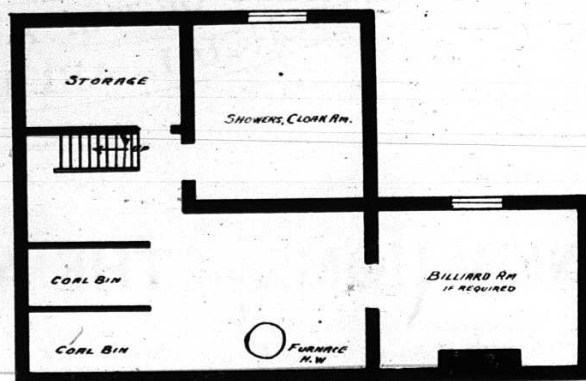
Our trip from Toronto across Niagara was very pleasant and no doubt Colonel Gibson has before this described it to you.

Our reception at Detroit was perfectly wonderful. There were thousands of people waiting to receive us and the congestion on Belle Isle was so great that they were compelled to close the bridge to automobile traffic.

We are sending you herewith a pamphlet illustrating and describing the Aerial Service we have just inaugurated here in New York City, and I want to extend to



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BASEMENT.

you a cordial invitation, whenever you are in New York, to take a flight with us as our guest, as you will find it well worth while.

We are also sending you under separate cover a framed group of photographs showing the "Santa Maria" and one of her sister ships, the "Pinta," which may be of more or less interest to your members.

Hoping to see you in New York some time during the summer, permit me to remain,

Cordially and sincerely yours,

AEROMARINE ENGINEERING & SALES CO.

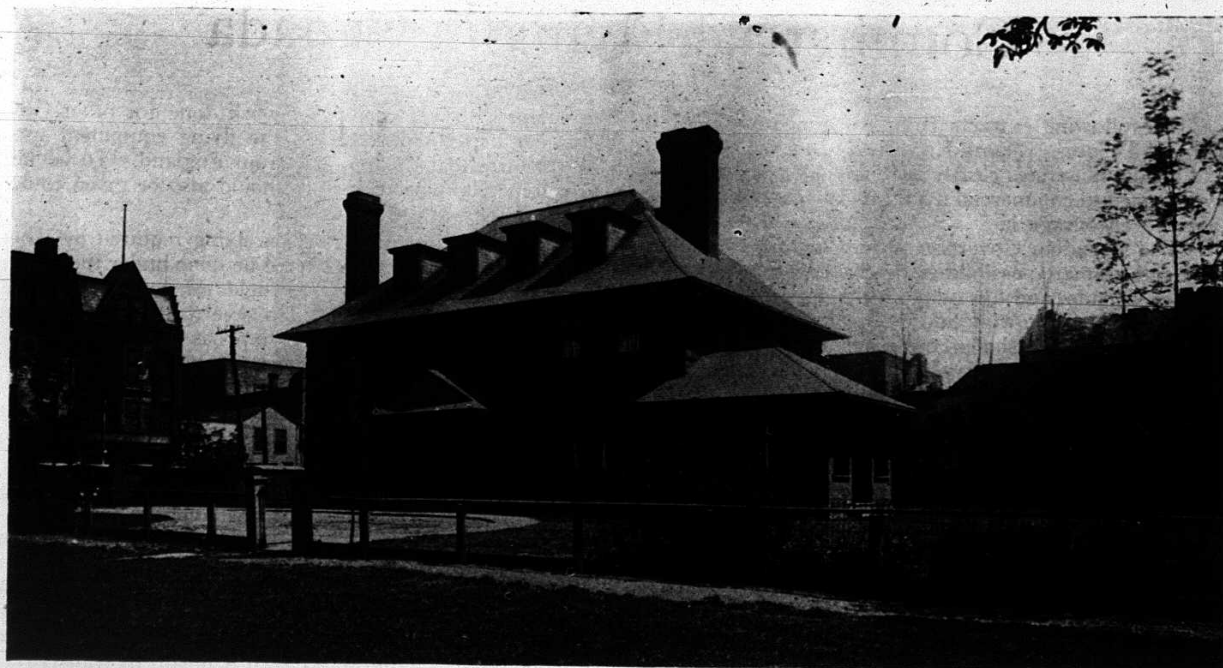
C. F. Reddin, President.

The following have recently joined the Aero Club: Major-General Sir Willoughby Gwatkin, K.C.M.G., C.B., Air Board, Ottawa; E. W. Beatty, Esq., President C.P.R., Montreal; Lt.-Col. E. W. Stedman, Air Board, Ottawa; Lt.-Col. C. O. H. MacAlpine, Toronto; A. D. McMillan, Esq., Toronto; Capt. Crockett, Victoria, B.C.; Capt. J. O. Groves, Dean's Green, Cheshire, England, and Camp Borden; Lieut. J. T. Menzies, Hamilton, Ont.; James E. Jones, Toronto.

Mr. Henry J. Bowker, of Christobel, Panama, is a recent applicant for membership. Mr. Bowker served with the Royal Air Force in England, France and Egypt, and is with the U.S. Air Service and also editor of "Airco News, Panama."



# View of New Home of Aero Club of Canada



Formerly the St. James' Rectory, Adelaide St. E., Toronto.

## AERO CLUB HOSPITALITY

Following on the recent ceremony at the Aero Club, when Major-General Sir Willoughby Gwatkin, Inspector-General Canadian Air Force, unveiled a portrait of the Prince of Wales, Col. Thomas Gibson, the President, has received the following letter from General Gwatkin:

The Air Board, Ottawa,  
June 24th, 1921.

Dear Col. Gibson:

I wish to thank you once again for your kindness and hospitality. We were delighted, one and all, at the reception you gave us.

Not until yesterday did I know how much the Aero Club of Canada has done, is doing, and is ready to do for the C.A.F. I now realize what valuable assistance it can render, and how desirable it is for the Club and the Air Board to co-operate.

Yours very sincerely,

W. GWATKIN.

## AERO CLUB NEWS

By the courtesy of Lieut. Ivan Marks, a member of the Aero Club of Canada, we are enabled to show the landing of one of the Imperial Oil Company's J.L. 6 monoplanes at Fort Smith in the far north on 30th May this year. The aeroplane promises to be a great factor in the development of Canada's vast resources lying in the unexploited north.

It will be remembered that it was necessary to fit the monoplanes with floats. The seaplane type of machine is continually proving itself the most suitable for many conditions in Canada.

Communications have been received recently from the following: D. Napier & Son, Ltd., of London, England; The Bristol Aeroplane Co., Ltd., of Bristol, England; Short Brothers, Ltd., of London, England; The Aeromarine Engineering & Sales Co., of New York; G. E. Barn-

hart, Aeronautical Engineer of Pasadena, California; and The Comite Francais de Propagande Aeronautique of Paris.

The correspondence in part from some of the above being of general interest to the members of the club and others, is published in another part of our issue. Those members wishing to read all this correspondence may do so by applying to the Secretary.

Any members wishing to obtain copies of "Achievements in the Air," mentioned by Napier & Sons, may do so through the club. Manufacturers of aircraft and aeronautical equipment who are asking for the names of users of aircraft in Canada have been supplied with lists by the Aero Club. These lists may not be complete, so it is desirable that all individuals or concerns operating aircraft in the Dominion should send in their names and addresses to the Aero Club.

## BRISTOL LOOKS TO CANADA

The Bristol Aeroplane Co., Ltd.,

Bristol, Eng., May 26, 1921.

Aero Club of Canada,

Toronto, Canada. \*

Dear Sirs,—We are very desirous of keeping in touch with matters connected with the development of commercial aviation in Canada. For this reason we should much like to be acquainted with the titles, addresses and details of equipment of the various concerns in the Dominion intending to carry on aerial transport work during the coming summer. We imagine that probably this information may be available in the files of the Aeronautical Development Section which we understand you have organized, and any details you may care to communicate to us will be greatly appreciated.

Yours faithfully,

H. WHITE SMITH,  
Director and Secretary.

## Commercial Flying in Canada

*By Douglas Joy.*

The following extracts from Appendix No. 3 of the General Progress Report No. 7 issued by the Air Board of Canada, illustrates clearly the view taken by the Board with regard to commercial flying in Canada and the action taken to encourage it.

"The Canadian Government fully realize the importance and ultimate possibilities of civil aviation in a country like Canada, and has adopted the policy of encouraging it along the following lines:—

"(1) The establishment of an operations branch which confines itself to the carrying out of such flying operations with heavier than air machines as are required for the various departments of the Government in relation to forests, fisheries, surveys, customs, etc., and to scientific experimental work.

"(2) The Canadian Government has not undertaken to subsidize directly any commercial air service. The view taken has been that such services were not at present likely to be profitable in Canada if operated independent of the existing railway and steamboat companies. The railway and steamboat connection between large centres in Canada are efficient, and air competition, if it involved the maintenance of expensive administrative and auxiliary departments, has been thought likely to be unprofitable. Existing transportation organizations have, on the other hand, not shown any desire to establish their own air services. There is, moreover, an independent field for air operations in the sparsely settled and undeveloped portions of Canada, in which at present communications are inadequate. Exploration and communication services by aircraft in these areas depend chiefly upon timber, mining or the like enterprises which, if adequately financed can, with the assistance of the technical and operations branches of the Air Board, operate advantageously and profitably. Such individual interests do not, however, justify direct assistance on public grounds.

"(3) To sum up, the view taken by the Canadian Government has been that commercial aviation in Canada can for the present best be encouraged and developed by administrative assistance and the provision and improvement when necessary of ground equipment, not, however, including terminal air harbors serving urban centres. There is a probability that as time goes on so many of these may be required that for the Government to undertake the provision of some of them would have the effect of stifling local effort and thus hinder rather than advance the general development."

In this report certain other steps taken are mentioned, such as regulations for civil flying, the technical branch, air routes, emergency landing grounds, and the loan of airship equipment. These would assist commercial flying, if it existed to an extent sufficient to warrant the expenditures made in these lines.

To many an interested observer the above extract seems absurdly inconsistent. "To encourage civil aviation . . . the establishment of an operations branch," establishing a flying organization with which no commercial company could compete, since the operations branch carry out flying work for other Government departments at less than cost to the Air Board, the operations branch receiving an appropriation for this year of about three-quarters of a million dollars. About one-tenth of

this sum will be received for work done for other Government departments. Also, the flying equipment used by the Air Board was a gift from England. To be fair to commercial concerns, they should also be given equipment, if they are to compete.

If it is the intention that the flying required by other Government departments should be done under the "Government ownership plan," the field for commercial concerns is vastly restricted. However, it is our opinion that while Government ownership has proved to be excellent in such industries as are essentially a monopoly, such as electric power, water, gas, and perhaps railway transportation, it is not suitable for aeronautics, aircraft and their work may be considered as comparable to the motor car industry.

Referring to paragraph (2) it is very obvious that to-day aircraft in Canada can not compete to any considerable extent with existing transportation facilities in cost, regularity or reliability; one might as well endeavor to compete with freight trains and ocean liners with a motor truck or motor boat. The field for aircraft is truly in the sparsely settled districts, where they will enter into competition with the prehistoric means of transportation—a man with a pack on his back, dogs, horses, canoes, etc.—where time, roadways or waterways and distance are a large consideration. It is in these districts that the field for commercial flying concerns are so restricted, the operations branch of the Air Board taking the cream of the business, such as forest patrols, surveys, fisheries, customs, etc.

The result of all this is that business available for commercial flying concerns to-day consists largely only of joy riding, advertising and exhibition work—seasonable work only, unreliable and in the long run not very profitable.

Aircraft, owing to their present high cost and short life, with consequent high depreciation and interest charges, must be kept working as continuously as possible throughout their life to ensure profitable returns. Therefore it seems apparent that it would not be profitable to either the Air Board or private concerns to operate where the business available is shared; e.g., the operations branch undertaking surveys, etc., and private concerns transportation.

Amongst those interested in aviation the demand seems to be for work, not subsidies, in either cash or equipment.

A further inconsistency of the Air Board only indirectly connected with commercial aviation is the maintenance of two flying departments—the Canadian Air Force and the Operations Branch. These two departments overlap in many ways; for instance, the operations branch undertakes training and military work, etc. It also would be desirable that some of the work done by the operation department, such work as is necessarily done by the Government, as police, customs patrols and military survey work, should be done by the Canadian Air Force, both as a means of training and carrying out legitimate work.

Surely the organization and policy of the Air Board can be improved.





**CAPT. J. F. TUPPER**

Hon. Capt. the Rev. J. F. Tupper, whose photo appears in this issue, is the Chaplain to the Canadian Air Force. He has the distinction of having been the first clergyman in the world to take a flight in a heavier than air machine, which he did some thirteen years ago when flying was in its infancy. At the outbreak of the Great War he volunteered for the Flying Corps, but was over age for that branch of the service. He was the first clergyman in Canada to become a recruiting officer and gave the first recruiting speech in his native Province of Nova Scotia, where he became Chief Recruiting Officer of Pictou County and personally attested over twenty-two hundred men for service overseas. He enlisted as a combatant and went overseas as a Chaplain in the Nova Scotia

Highland Brigade. In recognition of his work as a recruiter he was sent to France almost immediately, where for nearly two years he was attached to The Royal Canadian Regiment and other units. He was then transferred to the Canadian Forestry Corps in Scotland and also acted as Chaplain to the American Navy. In addition to his regular work during the war, he was associate editor of "The Highlander" with the celebrated Dr. J. D. Logan and also acted as correspondent to several large publications. On his return he took part in the Victory Loan campaign in Toronto and became prominent in returned soldier matters. For eight months he acted as editor of "The National Veteran." He has edited other publications, including Aviation News.

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# Canadian Air Force Officers Completing Recent Tour of Duty at Camp Borden

List of Canadian Air Force Officers who have completed a tour of duty at Camp Borden as from June 7th to July 12th, 1921, follows:—

## ORDER OF RANKS (Low to High)

Pilot Officer—P.O.

Flying Officer—F.O.

Flight Lieutenant—Flt.Lt.

Squadron Leader—Sqd. Ldr. or S.L.

Air Commodore—Air Comm.

P.O. Albert Oliver Adams, Box 59, Bowesville, Ont.

F.O. Edgar Atheling Alton, 482 Gertrude Ave., Winnipeg, Man.

Flt.Lt. Ellis Anthony, Maitland, Hants Co., N.S.

F.O. Percival Elliott Biggar, 70 McGill College Ave., Montreal, P.Q.

Flt.Lt. Kenneth Gordon Boyd, West End Y.M.C.A., Toronto, Ont.

F.O. Basil Malcolm Bowyer-Smyth, Okanagan Mission, B.C.

F.O. Lloyd Randolph Brereton, c-o H. Hoodspith, R.R. No. 1, Winnipeg.

P.O. Lynn Brown, 10135 117th St., Edmonton, Alta.

F.O. Guy Colmar Carr-Harris, 528 Bloor St., Toronto, Ont.

F.O. Aloysious James De L. Chopin, 360 MacKay St., Montreal, P.Q.

P.O. Gordon Thomas Collinson, Y.M.C.A., Winnipeg, Man.

P.O. Albert Bickmore Corey, c-o G. H. Illsley, Port Williams, N.S.

P.O. Emile De L'Orme, 418 Albert Ave., Saskatoon, Sask.

Flt.Lt. Roger A. Delhaye, 3134 13th Ave., Regina, Sask.

Flt.Lt. W. F. Forrest, North Battleford, Sask.

P.O. Havelock Cameron Graham, Box 78, Elmvale, Ont.

P.O. John William Grant, Buitley, Alta.

F.O. David Allan Harding, 460 Divine St., Sarnia, Ont.

F.O. Albert St. Julian Highstone, 377 Albert St., Soo, Ont.

S.L. A. C. Cooper Johnston, 1127 19th Ave. W., Calgary, Alta.

P.O. Owen Matthews, Box 65, Portage La Prairie, Man.

F.O. John Tate Menzies, 905 King St. E., Toronto, Ont.

P.O. Duncan Leslie MacDonell, B.X. Ranch, Vernon, B.C.

P.O. Walter McKay, University of Alberta, Edmonton.

P.O. F. J. Prevost, 595 St. Denis St., Montreal, P.Q.

F.O. William Frank Purvis, 90 Beech Ave., Toronto, Ont.

F.O. Harris Hooper Reade, Wincham Farm, Cloverdale, B.C.

P.O. W. I. Riddell, Frobisher, Sask.

P.O. Robert Lyle Scharff, Hartney, Man.

P.O. Sydney George Smith, 56 Concord Ave., Toronto, Ont.

F.O. Robert Stanley Evans Walshe, Foam Lake, Sask.

Flt.Lt. Joseph Leonard Marie White, Cliffside Cottage, Sydney Mines, Cape Breton, N.S.

P.O. Frederick Roberts Winter, 596 Victoria Ave., Westmount, P.Q.

P.O. Charles Douglas Wright, 250 Catherine St., Ottawa, Ont.

F.O. Francis Herbert Whiteman, 65 Duke St., Kitchener, Ont.

List of C.A.F. Officers who have completed a tour of duty at Camp Borden as from January 24th to June 7th, 1921:—

P.O. Harold Arthur Argles, 300 Huron St., Toronto, Ont.

P.O. Arthur James Ashton, Lumby, Mt. Vernon, B.C.

Flt.Lt. Milton Ernest Ashton, 17 Kitchener Ave., London, Ont.

F.O. E. Dale Sydney Atkinson, 360 Shaw St., Toronto, Ont.

Flt.Lt. Wilbert I. Bailey, St. Mary's, Ont.

P.O. John Rupert Baisley, 338 Broadway Ave., Winnipeg, Man.

P.O. Francis Alex. E. Bastien, 74 St. Famille St., Montreal, Que.

F.O. Andrew Gordon Beattie, 707 Queens Ave., Toronto, Ont.

P.O. Edwin J. Bell, National Drug & Chemical Co., Saskatoon, Sask.

F.O. Carl Stanley Bellamy, 799 Jessie Ave., Winnipeg, Man.

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P.O. Allen Haley Bill, 28 Coronation Court, Saskatoon,

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 F.O. John J. L. Bouey, 212 Winch Bldg., Vancouver, B.C.  
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 P.O. Charles Holden Browne, 16 St. Anne's Rd., Toronto, Ont.  
 P.O. Donald T. Brown, Yorkton, Sask.  
 P.O. Harry Edgar Bryant, 379 Broadway Ave., Winnipeg, Man.  
 P.O. Victor McKay Burns, Box 44, Regina, Sask.  
 P.O. John Lewis Burtt, 665 Pine St., Victoria W., B.C.  
 F.O. Charles Wm. L. Calvert, 34 Huntley St., Toronto, Ont.  
 P.O. William Charles Campain, Portage La Prairie, Man.  
 P.O. Frank Campbell, 61½ Sandwich St. W., Windsor, Ont.  
 P.O. Gershum Harold Campbell, 2339 Quebec St., Regina, Sask.  
 Flt.Lt. Geo. Herbert S. Campbell, Verona, Ont.  
 P.O. Earl Henry Carlisle, 60 Bellevue Ave., Toronto, Ont.  
 P.O. John Arthur Carswell, Red Deer, Alta.  
 F.O. Albert Carter, 2602 2nd Ave. N.W., Calgary, Alta.  
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 P.O. Robt. Dunsmore Chalmers, 281A St. Antoine St., Montreal, P.Q.  
 Flt.Lt. George Colving Champ, 1915 Skailivay St., Regina, Sask.  
 P.O. Ralph S. Chisholm, Denzil, Sask.  
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 Flt.Lt. Wm. Jas. Arthur Duncan, 322 Water St., Vancouver, B.C.  
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 P.O. David C. Girardot, 137 Mill St., Sandwich, Ont.  
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 P.O. Joseph W. Lavoie, 1186 Bond St., Verdun, Montreal, Que.  
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 P.O. Geo. Wray Lazenby, Bell Ewart, Ont.  
 P.O. Willaford Ransom Leach, Oakville, Ont.  
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 F.O. Wm. Schuyler Lighthall, 14 Murray Ave., Westmount, Montreal, Que.  
 P.O. James Alfred Longley, 1846 Nelson St., Vancouver, B.C.  
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 F.O. J. Achille LeRoy, 173 Daly Ave., Ottawa (deceased).  
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## Farewell to Col. Williams at Camp Borden

Those who were privileged to attend the farewell dinner in honour of Lt.-Col. J. Scott Williams, M.A., A.F.C., at Camp Borden recently, and there were many, were impressed with the wonderful popularity of this splendid officer. The spacious dining room at the officers' mess was suitably decorated for the occasion. There were in attendance officers of the camp, wives of married officers, and ladies and gentlemen of other places. After the toast to the King had been proposed by Col. Williams, the second in command, Capt. Anderson, proposed the toast to "Our Commanding Officer—Col. Williams."

Capt. Anderson paid a very high tribute to the retiring Commander. He said that it was seldom an officer had the privilege of speaking his mind concerning his C.O. in the latter's presence, and that it was his intention to take full advantage of the occasion. This he did. He pointed out that Col. Williams had been at Camp Borden since the time of its inception as a Canadian Air Force Camp and that during all this time those who worked under him found him efficient as an officer, and when off duty a true comrade and friend.

In reply Col. Williams, who on rising received a tremendous ovation, told what a pleasure it had given him to work with those who had so ably supported his ideas and had so efficiently and cheerfully carried out his instructions. He regretted the end of his tour of duty had come, and urged all to stand together and to work for the establishment of a permanent and a real live Air Force in Canada.

Capt. Oscar Berry, who has been at Camp Borden almost since the time of its inception as a C.A.F. Camp, proposed the toast to the "Canadian Air Force." He feelingly referred to the going of Col. Williams, whom he considered one of the chief corner-stones of the Force. He pointed out that the C.A.F. is still in its infancy, and like an infant, is suffering from many minor complaints which could all be cured with the proper treatment and the C.A.F. grow into a mighty organization.

Capt. Cuffe proposed the toast to "Our Guests" and spoke very pleasantly of the happy relations existing between the Camp and surrounding places, and the kind treatment accorded the men from Camp Borden.

Short addresses were given by Major Johnson, Capt. J. F. Tupper (Chaplain), Mr. Leslie, and others. Major Johnson, who is a medical practitioner in Western Canada, said that when visiting a place he judged the efficiency of those in charge by what might be termed "tone." In Camp Borden he had found the "tone" so marked that there was no doubt in his mind about the Commanding Officer being both popular and efficient.

Capt. Tupper said it had been his privilege to work in conjunction with a number of very excellent commanding officers during the past seven years, and that while he remembered the others in thoughts of highest appreciation, he had met no one more suited for his high responsibilities than Colonel Williams. He noted that Captain Berry had referred to the C.A.F. as an infant suffering from minor ills and reminded those present that as such it has the privilege to cry and kick till it gets what it wants.

Mr. A. Leslie, who is a Bank Manager at Barrie, said that he was very glad that it had been his privilege to be resident near Camp Borden, and that during all the time the Camp had been in existence there was no period during which more happy relations existed than while Colonel Williams was in command.

After dinner dancing was indulged in till supper was served.

At the Sergeants' Mess a very similar function took place, where the Colonel was assured of the high esteem in which he was held by all ranks in the C.A.F. in Camp Borden.

Colonel Williams is the greatest Avro pilot in the British Empire. He was one of the original instructors of the famous Gosport System. In flying he ranks in the first half dozen greatest all-round aviators in the world.

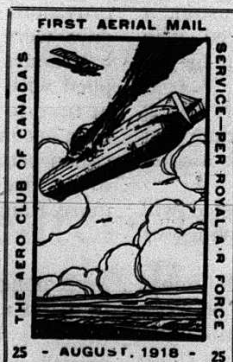
### FLYING BOAT ON LAKE GEORGE

Captain S. C. Parker, formerly of the Royal Air Force, is now operating a flying boat on Lake George. Captain Parker was very successful on Lake George during 1920 and is reported as doing a great deal of flying this season.



Sitting (from left to right)—Capt. Hose, Naval Dept.; Gen. Sir Willoughby Gwatkin, Inspector-General C.A.F.; Munro Greer, K.C.; Sqn. Leader Scott Williams; Gen. MacBrien, General Staff Militia, Can.





## AERIAL STAMPS FOR SALE

The Aero Club of Canada offers for sale a number of unissued stamps, authorized for use during 1918 and 1919, in connection with the First Aerial Mail between Toronto and Ottawa, and Toronto and New York.

### PRICES—

**Toronto—Ottawa Stamps - 50c each**

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**Discount to Aero Club of Canada Members - 30%**

### ADDRESS—

**Secretary, Aero Club of Canada,  
134 Yonge St., Toronto**

# Great Forest Fire Suppressed by Aircraft

By Capt. J. F. Tupper, C.A.F., Camp Borden, Ont.

A forest fire in Northern Ontario was rapidly suppressed by the efficient and effective use of aircraft in spotting and reporting the conflagration and the subsequent carrying of forest fire rangers to the scene of the fire. This is confidently stated by R. N. Johnston, a forest observer, in his official report just received, who is attached to the Mobile Unit at Sioux Lookout by the Provincial Government of Ontario.

Lt.-Col. Robert Leckie, D.S.O., Director of Flying Operations, states that this is probably the first time that this has been done in Canada and the operation is a complete success.

A summary of the official report just completed will be of interest to all Canadians desirous of preserving our valuable timber lands.

While flying to Clear Water Lake to sketch timber types, the observer first noticed a small blaze between Cliff and Cedar Lakes, District of Kenora. At this time it was so small that it could easily be mistaken for a camp fire. On his return trip it was pin-pointed and had during this short time of three-quarters of an hour, increased in size appreciably. On arriving at Sioux Lookout he notified Fire Chief Dowd of Kenora.

Authority was secured from the Provincial Forester, E. J. Zevitz, at Toronto, and Rangers Carroll and Labarre, with provisions for two days and necessary fire-fighting equipment, were landed at Cedar Lake, seventy-five miles from Sioux Lookout and within one mile of the fire. The following day, owing to a heavy gale fanning the almost extinguished flames, two machines were employed to take four more men with provisions for three days and necessary fire fighting equipment. Additional provisions were taken to Cliff Lake by aircraft and of course the Rangers returned by air route.

Aircraft without doubt was of tremendous value to Canada in this instance, owing to the extremely bad fire conditions, due to the lack of rain, making any fire at the time a potential source of disaster to the whole countryside. The fire's position, too, was such that it was inconspicuous from the regular Rangers' canoe route and would not have been located until of such size as to be beyond control. The fact of its being valuable land and the rapidity with which it was gaining ground made it important that Rangers should be on hand at once.

Aircraft can claim the following triumphs in connection with the rapid and successful suppression of this

fire: 1. The detection and accurate location, at least two days in advance of ground methods. 2. Excluding the necessary time elapsing between applying for and receiving authority to proceed with the work, two men with provisions and necessary fire fighting equipment for two days were placed at the fire approximately three and a half hours after detection. 3. Reinforcements were supplied with necessary fire fighting equipment and supplies in time to cope with the situation which could not have been accomplished by canoe. 4. Because rapid communication between the fire and Sioux Lookout, the condition of the fire was known from day to day and if necessary more Rangers and equipment could have been taken in.

## BLERIOT VISITS CANADA

Among the party of the French Commission which visited Canada recently were Monsieur and Madame Bleriot. Monsieur Bleriot will be remembered as the aviator who was the first to fly across the English Channel in 1908 from France to England in a monoplane.

Monsieur and Madame Bleriot were entertained to dinner by Lt.-Col. and Mrs. Douglas Joy. Among the guests to meet these distinguished visitors were Major and Mrs. Douglas Hallam, Major and Mrs. A. M. Shook, Major and Mrs. E. Grahame Joy, Mrs. Keith Tailyour and Capt. A. J. Hember.

It was the intention to entertain Monsieur and Madame Bleriot at the club, but they were only in the city for a few hours on Dominion Day. They expressed themselves as being delighted with their visit and regretted that the short time at their disposal did not admit of seeing but very little of the country.

## AERIAL STAMPS FOR SALE

BY AERO CLUB OF CANADA

In 1918 and 1919 aerial mails were carried on a few occasions between Toronto and Ottawa, and Toronto and New York, under arrangements made by the Aero Club of Canada. At that time aerial mail stamps were issued by the club, which were used on the letters sent in addition to the ordinary postage.

There are still a small number of unissued stamps available. The face value of the Toronto-Ottawa stamp is 25c and the Toronto-New York, \$1.00. As no aerial mails are now being carried between these points, even these unissued stamps may be of value from a commemorative viewpoint to both members and stamp collectors. We had not recently taken any action to dispose of these, but are now reminded of them from an enquiry received from a stamp dealer in Europe, wishing to obtain a number of them.

Before disposing of any through this source we wish to give our members and others an opportunity to obtain any they may require. The price of the Toronto-Ottawa stamps are 50 cents each; the Toronto-New York are \$1.00 each. Anyone requiring a supply should send stamped addressed envelope with remittance (stamps, cash or money orders) to the Secretary, Aero Club of Canada, Toronto. A discount of 30 per cent. to members of the Aero Club of Canada. Order promptly, as only a few are available.

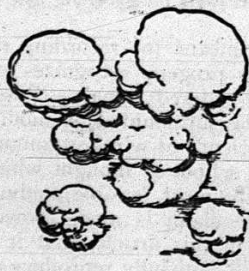
## MAJOR GORDON IN COMMAND

Major J. L. Gordon, D.F.C., has been appointed in command of the Canadian Air Force at Camp Borden.



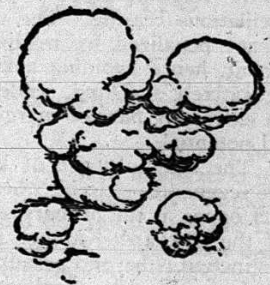
Penetrating Northern Canada by Aeroplane. Above is shown Imperial Oil Company's Monoplane after landing at Fort Smith.





# RADIO

## NEWS



### Radio Experimenters Interested in New Automatic Recorder

Canadian radio men will be interested in a new automatic recorder recently produced in the United States.

With 3,800 miles intervening, the manipulation of a fountain pen on the third floor of the Northwest Building, in a laboratory of the National Bureau of Standards, Washington, D.C., by the action of an individual in Lyons, France, would seem to suggest the eighth wonder of the world. The apparent phenomena is explained by a description of an instrument for automatically recording radio signals, an invention jointly sponsored by Dr. E. A. Eckhardt and Dr. J. C. Karcher.

The writing of wireless messages in the absence of the human ear is not without precedent, a variety of mechanical means having been devised. The Eckhardt-Karcher progeny, however, has established claims to novelty and its use for held service by the Coast and Geodesic Survey this summer is a testimonial subscribing to its practical application. In fact, the device was developed for the specific purpose of recording radio time signals, its adaptation to the writing down of other wireless signals being but a natural outcropping. Compactness, being portable, and its simplicity, are virtues vouchsafed for the invention.

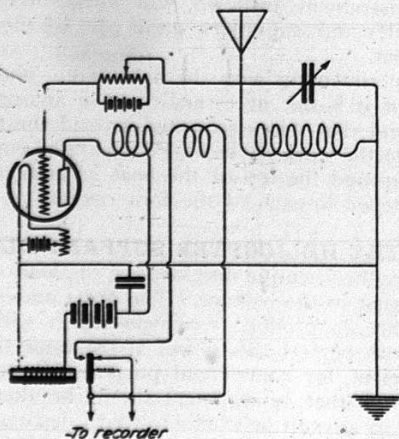
The apparatus itself consists of a regenerative elec-

tronic circuit. A variable condenser and fixed inductance comprise a tuned circuit in the grid circuit of the tube. In the plate circuit there is a fixed inductance and a plate battery.

In actual operation, the inductances, when agreeably coupled, excite a rise in the plate current which will stimulate the grid potential to action. This rise in grid potential will likewise result in a further rise in plate current. In a word, the circuit is regenerative. For a suitably selected filament temperature, starting with an adequate grid potential and gradually altering the same in the direction of more positive values, a grid potential will be attained at which the circuit becomes self-oscillatory.

The beginning of oscillations is attended by a rise in the mean plate current. The volume of the excitation of the latter is largely determined by the design of the circuit. One circuit employed by the Bureau of Standards was responsible for a variation in rise from a fractional milliamperes to several milliamperes, while in another unit, the excitation ranged from one or two milliamperes, to an ultimate value of 50 milliamperes. By inserting the windings of a telegraph relay in the plate circuit of the regenerative system the relay may be so adjusted that the inception of self-oscillations in the regenerative circuit will cause the relay magnet to attract the relay armature. Similarly, reversing the order, the ceasing of the oscillations will release the relay armature. Ultimately, if the circuit is properly tuned and agreeably related to a wireless-receiving antenna, with the mean potential adjusted to a value immediately below the critical one, an incoming signal raises the grid potential for the moment above the critical value. The regenerative circuit becomes self-oscillatory and the telegraph relay functions.

Thus the telegraph relay can be forced to operate any recording device. Not unlike the Irishman, however, who when being induced by the automobile salesman to purchase a speed-demon of a car, inquired, "How fast can you stop the thing?"; similarly, how can you stop the oscillations of the regenerative circuit? Drs. Eckhardt and Karcher have successfully answered this question. A restoral of the circuit to a receptive state, when the wireless signals cease, is accomplished by two contacts on the relay, one of which is closed when the relay armature is released and the other contact closed when it is attracted. The barring of the inner contact short-circuits a low-resistance coil of a few turns sandwiched between the

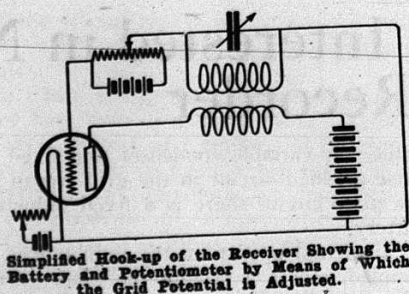


Complete Diagram of Connections of the Receiving Set.

tron-tube circuit. This involves the use of an electron tube, popularly known as an audion bulb, and a potentiometer for adjusting the mean potential to any specified

two regenerative coils. In effect, this action screens one of the regenerating coils from its companion, the self-oscillations ceasing. The opening of the screening coil is not penalized by readjustments in the regenerative circuit, hence avoiding a kick-back. This safety valve, figuratively speaking, renders it possible to operate with an extremely narrow margin with reference to the critical potential.

The utter absence of kick-back, or readjustment in the regenerative circuit when the oscillation-silencing contact opens, is the primary source of sensitivity and range of the Eckhardt-Karcher invention. Therein, claim to distinction is beyond peradventure—the first device to record mechanically, employing a single audion bulb, wire-



Simplified Hook-up of the Receiver Showing the Battery and Potentiometer by Means of Which the Grid Potential is Adjusted.

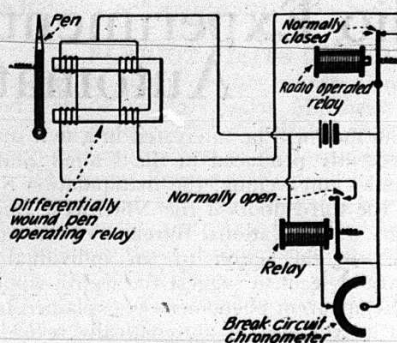
less messages from far-away European points. Freak performances are not credited to the invention, but the continuity of its behaviour in recording wireless conversations daily for a period of many months identifies the apparatus as being well-ordered. In the parlance of the street, as the phrase applies to human relations, this device is a "regular fellow." Its operation is under perfect control and in the reception of Transatlantic messages, the process may be repeated "world without end."

The recording apparatus is deservedly of interest. A sheet of paper, in a receptive mood for obtaining the record, is wound around a cylinder. The latter is rotated at a uniform rate of speed by a clockwork, picturesquely described by Doctor Eckhardt as being actuated much in the same fashion as the grandfather clock, by falling weights. When off duty, the recording fountain-pen traces a straight line, which for the sake of identification is described as the datum line. By tuning in on any transmitting station, the pen bids good-bye to the datum line when the signal begins only to return, when the message is concluded. Short and long humps in the datum line, bearing similarity to the dots and dashes comprising telegraph signals, are means of interpreting the long-distance communications so faithfully reproduced by this wonderful piece of mechanism. The recording apparatus employed is a chronograph on the pen, thus establishing the uniform practice of reading from right to left.

The device is portable, and can be readily transported on the back seat of a touring car. Furthermore, when connected to an improvised antenna, it can be operated from an automobile. For illustration, the resonance wave coil, whereby a complete antenna might take the form of a walking cane or thermometer, would serve admirably as a companion-piece of radio equipment to the automatic recorder. As a field instrument, the Eckhardt-Karcher invention will undoubtedly prove its usefulness in recording radio time-signals in the unfrequented places explored

by the Coast and Geodesic Survey of the United States Department of Commerce. It will be given a practical demonstration this summer.

Not unlike all mechanical means for recording radio signals, the Eckhardt-Karcher progeny recognizes static and "strays" as well as well-ordered signals. Possibly this inherent weakness may be surmounted by modifications not yet divulged to the science of wireless communication. Then, too, there is a school of thought which is partial to the human ear as the most feasible method of recording radio signals. The claim is made, however, for the apparatus described in this article, that it is a selective agent and as such will faithfully reproduce messages conveyed by electric waves—even from the utter-



Hook up of the Recording Apparatus.

most ends of the earth. Certainly the Eckhardt-Karcher creation is a notable contribution, and one whose practical usefulness will abundantly justify for it a place of enduring recognition among scientific achievements.—S. R.

### INSTALL A WIRELESS PHONE

Physicians, business men, or, in fact, any one who owns an enclosed motor boat or automobile, can now equip them with a wireless telephone at a cost of about \$50, or just about the price of a new tire or battery.

With autos thus equipped physicians can be in constant communication with their homes for emergency calls, and the business man in touch with his office.

The instrument, installed, will work successfully up to five miles and use only a small part of the auto battery current.

In experimenting with the auto radio 'phone it was found that it is not necessary to have antenne high in the air, and that wires stretched around the top of the car will do the work as well. Four parallel copper wires are run around the top of the boat or auto on six-inch posts fastened to each of the four corners.

### SHALL THE HELICOPTER SUPPANT OLD TYPES

To-day the scientific development of aviation seems to be somewhat in the balance. The great ambition of the human race to produce a vehicle which will travel in the air with perfect safety and at the same time be the most efficient for commercial purposes, brings up the question, whether development should be along the present type of aircraft or whether radical departures should be made in order to bring about the quickest and best results.

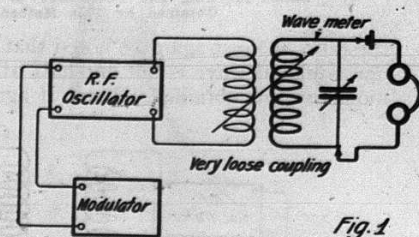
The arguments in favor of the helicopter seem to be gaining in popularity among aeronautical engineers and many concede that the helicopter will be a great factor in developments in the immediate future.



# How to Determine Wireless Telephone Percentage Modulation

The amateur who has a radio telephone set is, of course, interested in securing as complete modulation as possible with the apparatus which he has available. But most always he is at a loss to know just what his percentage modulation comes to, and has not the facilities for determining it. The object of this article is to describe a comparatively simple method for obtaining this information.

Of course the most accurate and the best way of determining this is to use the oscillograph, but this expensive instrument is not accessible to the amateur. His next best bet is to use the wave-meter in the manner described in the following: The wave-meter is tuned to the transmitting wave, and when no speech is applied the intensity of the click in the wave-meter phones is observed by opening and closing contact A in Fig. 1. Speech is applied to the set and the intensity of the received speech is noted in the same way, making sure to keep tuning and coupling of wave-meter constant. If the modulation



Here is a Simple Way of Determining the Proportion of Modulation by the Use of a Wave-Meter Loosely Coupled to the Radiophone Set.

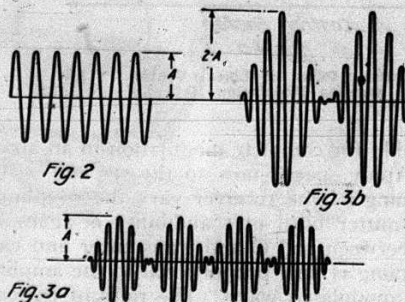
is complete the click will not be heard through the speech. This method is, of course, not very accurate, as the click will not be evident if the modulation is anything over 60 or 70 per cent. At any rate, it will give the amateur a fairly decent notion as to how his modulation is getting on, and as to the condition of his set, which he would not have otherwise.

The method to be described in the following is somewhat analogous to this crude method of the wave-meter, but is much more accurate and gives pretty good and reliable results. Briefly the method consists in chopping up the received wave, and measuring the audibility of received current with and without speech. The ratio thus obtained, as shown below, is the percentage modulation. The method does not require any apparatus other than that which amateurs as a rule are bound to have.

A sustained wave generator, say a vacuum tube, will radiate oscillations as in Fig. 2, the amplitude of these oscillations depending on the magnitude of the radiated current. If this wave is now modulated the amplitude of the resultant wave will vary in proportion to the modulation control, and the R. F. oscillations will be moulded into the shape of the audio modulation wave, as in Fig. 3. In general, if we assume that the control is linear, the curve showing the relationship between the radiated current and the controlling factor will be as in Fig. 4a, and the limits between which this curve runs will depend on

two factors: the method of modulation used, and the degree of control.

With regard to the first factor, the following may be said in general: If an absorption system of modulation is used, energy is abstracted from the oscillator by the modulator, but none is supplied and the resultant wave is as shown in Fig. 3a; that is, the control factor varies the amplitude of the R. F. wave from zero to the maximum unmodulated amplitude A, and the corresponding control curve is Fig. 4a. This is on the assumption of complete modulation. If a non-absorption system of modulation is used, energy is abstracted from and added to the oscillator by the modulator and the resultant wave is as shown in Fig. 3b. That is, the control factor varies the amplitude of the R. F. wave from zero to twice the maximum unmodulated amplitude A, and the corresponding control curve is as in Fig. 4b, again assuming complete



Comparison of Modulated Amplitude in the Absorption and Constant Current Methods. Fig. 3b Shows That When the Latter is Used the Maximum Amplitude May Amount to Double the Normal.

modulation. If the modulation is incomplete the control curve will run between limits smaller than either A or 2A (depending upon whether absorption or non-absorption systems are used, and greater than zero. Fig. 5 gives the case for non-absorption modulation, and the percentage

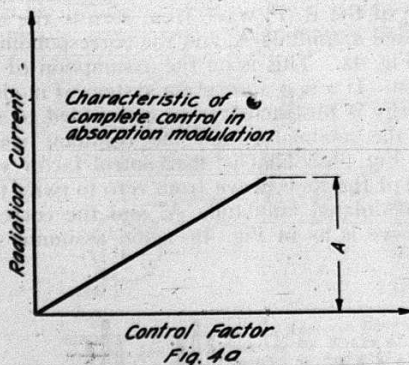
modulation will be given by the ratio  $\frac{B}{2A}$ . A similar

curve can be drawn for the absorption system. If, now, we can get a simple means for determining the ratio of the actual amplitude of the modulated wave to the maximum amplitude as required for complete modulation, we will be able to determine the percentage modulation of our set.

Since the degree of control is measured by the ratio of amplitude as shown above, it can also be measured by the ratio of any two quantities which are proportional to the mentioned amplitudes. Thus using a receiver with crystal detector, the telephone current, and therefore the signal intensity, is proportional to the received current, which is proportional to the transmitted current. Hence by using an audibility meter, which consists really of a telephone of known resistance and a calibrated resistance, in conjunction with a receiver, the modulation control can be readily determined. The following methods will then be found applicable.

**Method 1—(a) Absorption System**

A simple receiver consisting of a coil and variable condenser with detector and telephones is connected and tuned to the wave-length of the transmitter, Fig. 6. With no speech applied, the coupling M is varied by moving along a straight line the receiver coil C to or from the transmitter, until unit audibility is had. A chopper is used in the receiver for making audible the unmodulated continuous waves. The distance between transmitter and coil C is noted. Call this distance OA. For unit audibility this coupling is now proportional to the maximum



Characteristic Curve of Linear Control in Absorption Modulation Method.

amplitude possible for complete modulation in an absorption system. Apply speech now to the set and without altering the tuning of the receiver vary the coupling of coil C to transmitter until unit audibility is again had. Note distance between coil C and transmitter and call it OB. This coupling is now proportional to the amplitude of the radiated modulated wave. The ratio of the coupling distances OB to OA will give the percentage modulation. — = do Modulation.

OA

**(b) Non-Absorption System**

The same circuit is used, and the coupling distance noted for unit audibility when no speech is applied. Since in this system the amplitude is doubled for complete modulation, this coupling distance is really proportional to half the amplitude of a completely modulated wave, which fact will have to be considered in getting the percentage modulation. Call this distance OA, Fig. 6. Apply speech and vary coupling until audibility is again had and call coupling distance OC, which is proportional to amplitude of the actual modulated wave. The percentage modulation will then be given by the ratio OC to twice the

distance OA. — = do Modulation.

2OA

**Method 2—(a) Absorption System**

While the first method is based on a determination of the ratio of couplings at a fixed audibility, this method is based on a determination of actual audibilities with a fixed coupling. This is the more accurate of the two methods. The receiver is connected to an audibility meter and the same set up used as in Fig. 6, the coupling between receiver and transmitter to be very loose, however, in fact at opposite ends of the room, or in another room. Using the receiver, the secondary will pick up the transmitter signals. Receiver is tuned and coupling fixed and the audibility of the unmodulated chopped transmitted wave is measured by the audibility meter. Call this audi-

bility A, which is proportional to the maximum amplitude for complete modulation. Keeping all conditions fixed, apply speech to the modulator and measure the audibility of the received speech, and call this B. The ratio of B to A will be the percentage of modulation.

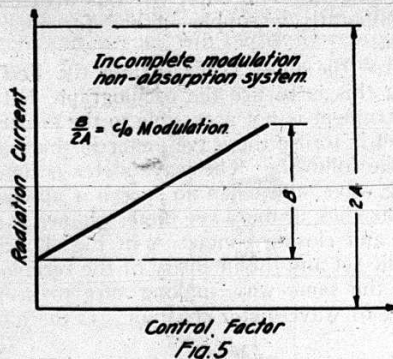
B

— = do Modulation.

A

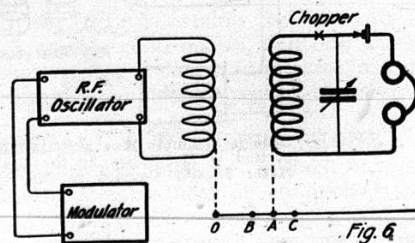
**(b) Non-Absorption System**

The same method is applied as above, but in figuring



Characteristic Curve of Constant Current Modulation Showing the Percentage of Modulation Obtained by This Method.

the ratio, it must again be noted that the audibility of the unmodulated wave is but one-half of that when complete modulation is obtained. Thus, if again we call the audi-



This Diagram Shows How an Audibility Meter is Used with a Radiophone to Determine the Percentage Modulation.

bility of the unmodulated wave A, and that of the modulated wave C, the ratio of C to twice A will be the percentage modulation. — = do Modulation.

2A

These methods are quite simple, and easily applied. They have been tried and found to be quite satisfactory, giving results which check with those obtained by more reliable and accurate methods.—M. W.

**BEHAVIOR OF A THREE-ELECTRODE VACUUM TUBE**

Eijiro Takagishi states that the above subject should be handled by starting from the dynamic or derived characteristics. These differ greatly from the static characteristics, which can be experimentally determined with ease. The writer then proceeds to derive mathematically the characteristics solely from the circuit conditions.

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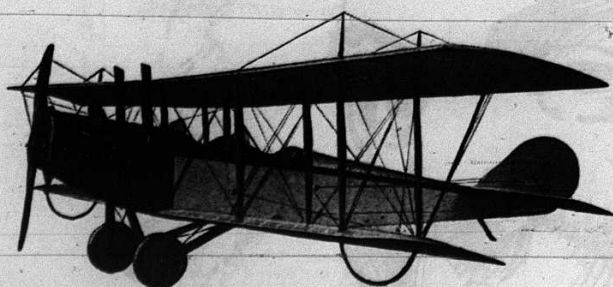
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## Britain vs. U.S.A. - Sail in August

Four Yachts From States Meet Four Britishers at Cowes

The international race arranged by the Seawanhaka Corinthian Yacht Club on this side of the Atlantic and the Royal Yacht Squadron, the Royal Victoria, Royal London and Royal Thames Yacht Clubs on the other side, promises to be the most interesting contest arranged and sailed in the history of yachting.

Four yachts have been built in this country, and these are to be shipped abroad on June 18, and after a few weeks of sailing in British waters, they will race against four British-built boats in a series of six races.

### Cement Amicable Relations.

This match was arranged to promote and foster the friendly feeling between the yachtsmen of the two countries to help to more firmly cement the amicable relations between the two countries and to thoroughly test out the rules in force abroad and at home, in order to find out the good points of each.

This year the yachts have been built to conform to the British rule of measurement, and next year British yachtsmen will visit this country with yachts built for one of our classes rated according to the American rule. A very handsome cup has been purchased, each country paying one-half of its cost, and this trophy is to be in competition for ten years.

The cup, which is 21½ inches high and weighs 245 ounces, is a copy of the Ashburnham Cup given to Clare Hall, Cambridge, by the Earl of Ashburnham, which was made by Paul Lametis, the most noted silversmith of his day, in 1739.

### Will Be Sailed in August.

The international races are to be sailed in August. Three of these races will be under the auspices of the Royal Yacht Squadron, and the Royal Victoria, Thames and London Yacht Clubs will each handle one race. It is a team match, and the winner will be determined by the point system, the team scoring the most points in the series capturing the cup.

To meet this American invasion a dozen British boats have been built, and at least eight of the best of last year's boats are in commission and preparing for the eliminating trials which are to be held to enable the British Committee to select the four best for the team. This shows how seriously the British have taken this invasion, and the contest promises to be second only to the races for the America's Cup.

### A FISHERMAN'S RACE OR NOT?

Considerable agitation has been started in Maritime Coast marine circles at the reports received on the schooner Mayflower, the American contender for the 1921 racing honors in the international schooner races. Mr. R. C. S. Kaulbach, of Lunenburg, Nova Scotia, has stated that a boat like the Bluenose will not have a ghost of a chance in a race with the American entry. The Bluenose, he says, is a fast fishing vessel, which no doubt would outsail any Lunenburg boat; but she would have a meagre chance against the Mayflower, which, according to his reports, has a finely lined wine-glass underbody, much like the cup racers.

He estimates that the Mayflower will be fifty tons less burden than the Bluenose when both are put in racing trim.

After the Delawana-Esperanto race last year, it was definitely and enthusiastically agreed to at the banquet, that a real fisherman's race should be maintained between genuine fishing schooners manned by real fishermen, and no freak boats should be allowed to enter.

This is what Mr. Kaulbach has to say about the Mayflower—and if what he states is right the American entry should at once be barred from competing by the International Committee:

"The Bluenose is not in the same class as the Mayflower and never can be made to win in any sailing contest with the Mayflower in and off Halifax Harbor unless they get caught in a gale with heavy seas, which is not likely to happen with fourteen to sixteen miles of harbor sailing in the official course as laid down for the races of 1920.

"The Mayflower is a schooner designed on perhaps the finest racing lines that were ever embodied in a vessel of her class in the U.S.A. She is the last word as far as that type of vessel goes—and speed lines predominate. She possesses a symmetrical, delicately and finely lined wine-glass under body that compels fast sailing, and her designer, Mr. Starling Burgess, her syndicate and her builders, are to be congratulated on her production.

"The question, however, remains, 'Is the Mayflower a real fisherman as intended by the promoters of the International Fishermen's Races?' That question must soon be settled by International Committee. In my opinion the difference in lines and construction of the Mayflower with those of the latest of the Lunenburg and Gloucester fleets is so great that a race between them would be of little interest (after the first day) unless those in command of the Mayflower chose to make it interesting for the public. The Mayflower is not a fishing schooner according to the Nova Scotian conception."

Taking the above for granted—and thereby realizing that the Americans are, as usual, more intent on the prize than on the sport of the thing, it would really be better, more dignified, to drop these races.

It must be a fishing schooner race and nothing else if the public is going to be interested at all. Cup races of the Lipton type are not what is wanted at all, and the sooner they realize this across the border line the better.

### SCHR. ESPERANTO FOUNDERED OFF SABLE ISLAND

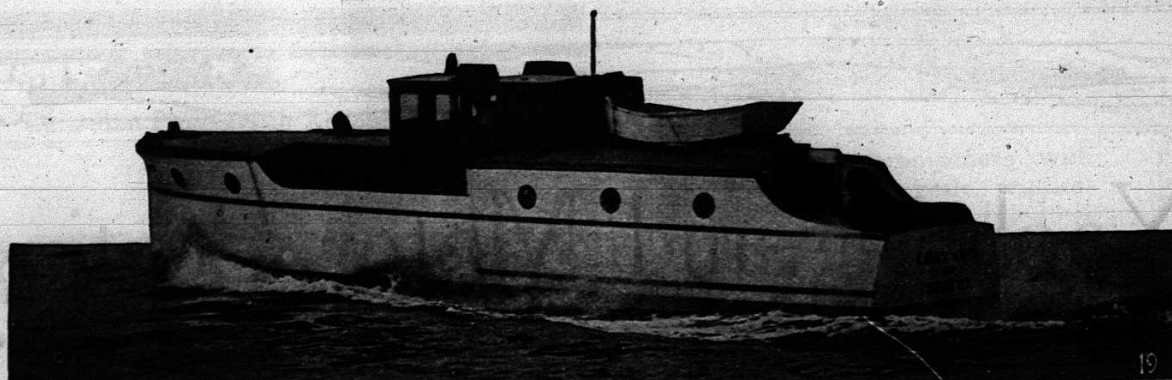
The fine fishing schooner Esperanto, the winner of the international schooner races held off Halifax last fall, sank near Sable Island recently. The details of her foundering are lacking, with the exception of the fact that the tops of her masts can be seen sticking out of the water.

The following report was received by the Department of Marine and Fisheries at Halifax:

"American schooner Esperanto, Captain Tom Benham, foundered one and a half miles south Sable Island; Captain Geel, schooner Elsie II, stood by; Esperanto sunk to cross trees. We turned over her dories and found name. Captain Geel left before we reached here."

It is presumed that the captain and his crew of 24 men were rescued by the Elsie II.

The fishing schooner Esperanto gained fame when she defeated the Canadian contender, Delawana, in two consecutive races for the championship of the North Atlantic fishing fleet last fall and captured the international cup for her owners, the Gorton-Pew Fisheries, of Gloucester, Mass. She was captained for the races by Marty Welch.



## The New 42-footer "Lady Luck" of Seattle

*Lady Luck*, pictured in the accompanying photographs, was built in the summer of 1920 by the Bezanson Boat Yards for S. V. B. Miller of Seattle, under Mr. Miller's direction. The boat is an express cruiser, and was designed for a combined business getter and pleasure boat, to be used by Mr. Miller, who has a number of marine engine agencies in Seattle, for rounding up business in the fishing grounds and among the canneries of Alaska. Since her completion the *Lady Luck* has made three round trips from Seattle to Union City, on Hoods Canal, a distance of about 90 miles, and a number of short trips besides. And on these trips she has shown good speed and proved herself an exceptionally able sea boat. Mr. Miller, her owner, is a member of the Seattle Yacht Club.

The *Lady Luck* has an over-all length of 42 feet. She is 9 feet in breadth and is of the V-bottom type. She is equipped with a pair of Model D 6 Scripps engines, which give her a cruising speed of from 12 to 14 miles per hour. In her engine room she has full head room throughout, and is one of the first bridge deck express cruisers ever built in Seattle to have this desirable feature.

The boat has sleeping accommodations for four persons and, since she requires a crew of only one man, it is possible for her to carry a fair-sized pleasure party. In the extreme bow of the vessel and separated by a water-tight bulkhead from the forward cabin just aft, is a chain locker. The forward cabin is provided with full-length box mattress berths with lockers beneath. On the port side a dresser is provided, but on the starboard this space is taken up with a hatch and companionway, which supplies a passageway from the enclosed bridge to the forward cabin without going through the engine room.

The engine room is 6 feet long and the breadth of

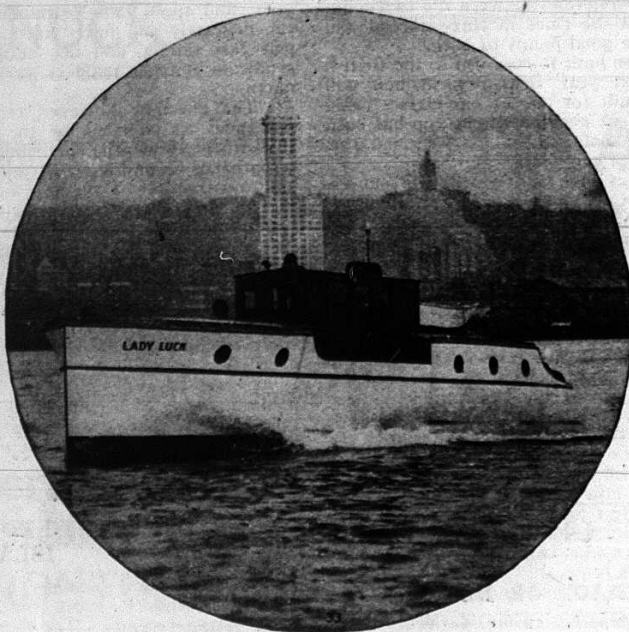
the boat in width. A passageway from the bridge to the forward cabin is left between the two motors, arranged on either side of the large room, with space by each for storage batteries. Amidships is the enclosed bridge, equipped with all levers, giving a complete one-man control from this point. On either side and under the bridge are 100-gallon fuel tanks, and two upholstered seats are also provided here. The instrument board and steering wheel are across the front of the bridge.

Just aft the bridge and on the starboard is the small ship's galley, which is supplied with a coal locker, a Shipmate range and porcelain sink with drain board. The dish lockers are over the sink and food lockers are provided under the sink and under the range. Just across from the galley, on port, is the lavatory, equipped with toilet and wash basin.

In the main cabin are two box-mattress seats, which are convertible into berths. Beneath these seats are water tanks with a capacity of 80 gallons. The main cabin is provided with a dresser and a clothes press. Across the stern of the boat is a stern seat, beneath which is the third 100-gallon fuel tank.

The forward and main cabins of the *Lady Luck*

are finished throughout in natural Port Orford cedar, Valsparred, the lavatory and galley are in white enamel, and the bridge is finished in mahogany. The feature of the boat in which Mr. Miller takes perhaps the most pride is the completely equipped instrument board, which has on it a clock, an ammeter for each engine, and oil pressure gauges for each motor. On either side are dash lights, which serve to illuminate the various instruments. Other instruments there are a pair of Boyce motometers, showing the temperature of each engine, revolution indicators, ignition switches, primers, a boat meter, showing the speed and miles per hour the boat is making, and an

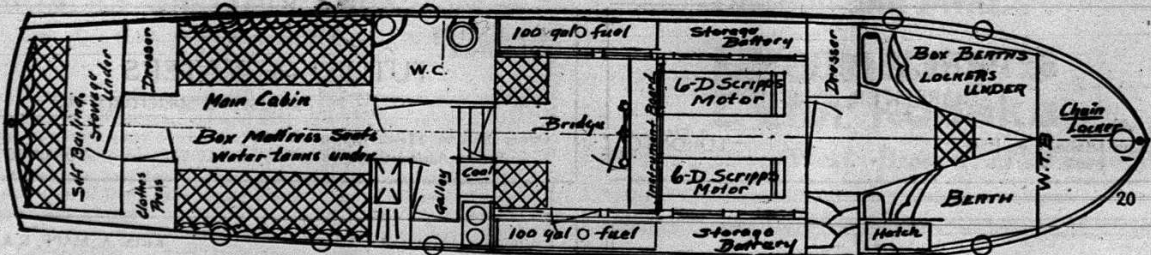


The Trial Trip on Seattle Harbor



air pressure gauge for the vibraphone whistle. At each corner of the instrument board and on the chart shelf are mounted spark and throttle levers for each engine. On each side is a folding clutch lever, and in each forward

The twin screw installation of the *Lady Luck* gives her a wonderful ease in handling, as she can be stopped and turned completely around in practically her length. She will cruise at nine miles per hour with one engine



Lady Luck's Cabin Plan

corner of the pilot house is an electric starting pedal for each engine.

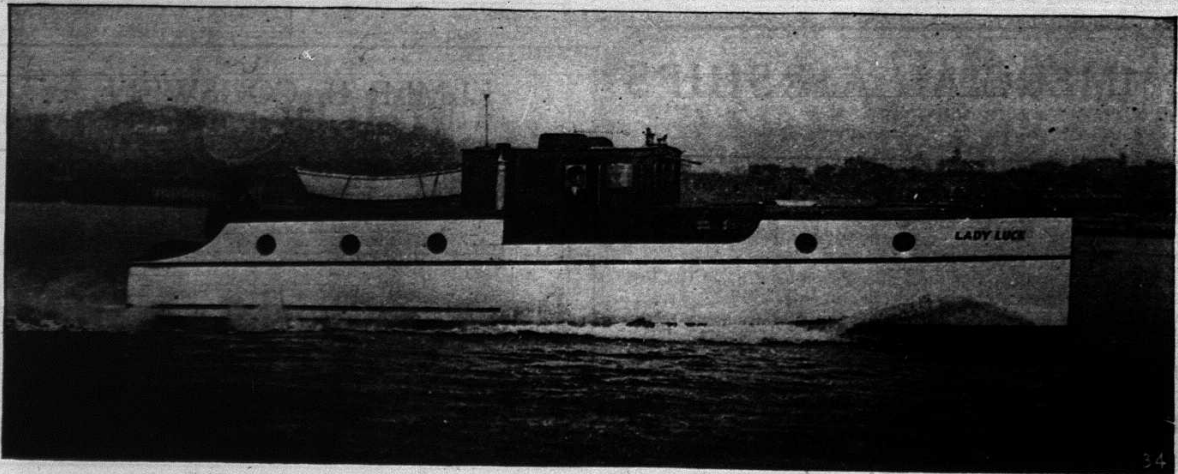
The *Lady Luck* carries a dinghy eight feet by four feet, built of cedar and weighing 80 pounds.

The stem and stern timbers are of oak with sawed-oak frames. The planking is of Port Orford cedar, one inch net on the bottom, one inch planking above the knuckle and three-fourths inch net above that. The deck of the craft is canvas covered. All the berths are of the box-mattress type, 10 inches in depth.

On the six single trips which the *Lady Luck* has made between Seattle and Union City, not considering the first

running, showing good fuel economy for that speed. Her engines will operate perfectly on either gasoline, kerosene or distillate. The *Lady Luck* is equipped with a small electrically-driven pump which is used for elevating fuel from all of the tanks to the smaller ones alongside the engine, from which the fuel flows into the engines by gravity.

The cruising radius of the boat is from 350 to 400 miles. Mr. Miller is planning some interesting trips for her this season, among which may be an extended cruise up the Inside Passage to Alaska.



A Broadside View of "Lady Luck" Developing Her Full Speed

trip, when her engines were running at very low speed for breaking in, her running time was from six hours twelve minutes, to six hours nineteen minutes, showing a very consistent performance.

The *Lady Luck* has never entered any races, and was built for durability rather than speed, the owner sacrificing from six to eight miles of speed to gain added weight for strength and stability.

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